



***Metro Nashville***  
**DISTRICT ENERGY SYSTEM**

*DES Advisory Board Meeting*  
*Fourth Quarter FY24*  
*August 15, 2024*



*Presented by:*  
*MNDES Project Administrator*  
*Thermal Engineering Group, Inc*

# *Agenda*

1. Call to Order
2. Review & Approval of Previous Meeting Minutes
3. Metro Liaison Update
4. Customer Sales
5. Marketing
6. Review of DES Contractor Performance
7. Natural Gas Purchasing Update
8. FY24 Costs to Date and Budget
9. FY25 Budget
10. Review of EGF and EDS
11. Capital Projects Review & Status
12. System Operator Update
13. Special Topics
14. Other Board Member Items
15. Adjourn

1. Call to Order
2. Review & Approval of Previous Meeting Minutes
3. Metro Liaison Update

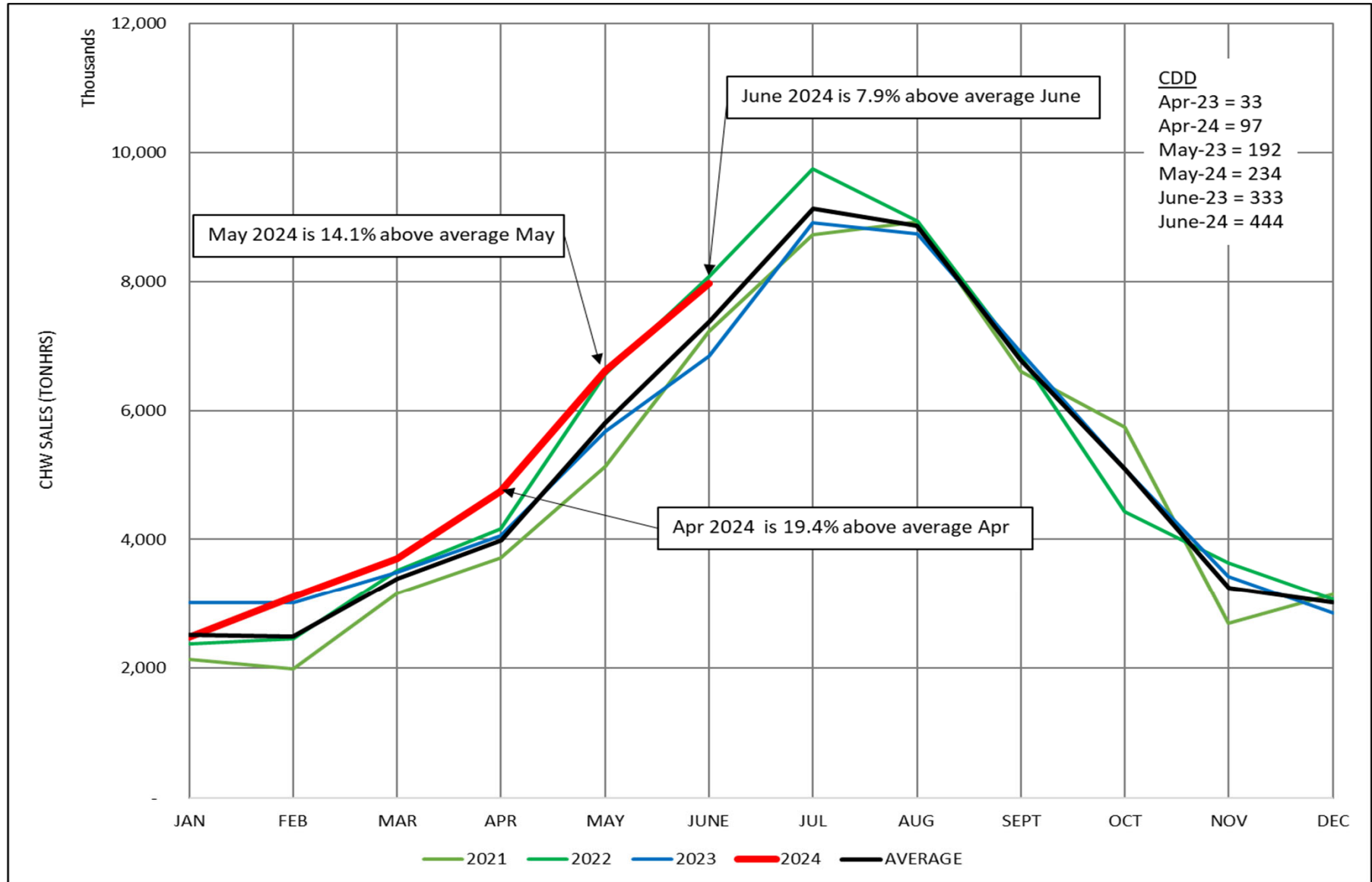
## 4. *Customer Sales*

- ❖ There are 0 customers in arrears more than 60 days
- ❖ Table 4: Customer Cost Comparison for the Previous 12 Months
- ❖ Figure 4A: Historic Chilled Water Sales
- ❖ Figure 4B: Historic Steam Sales

## Summary Table 4: Customer Cost Comparison for the Previous 12 Months

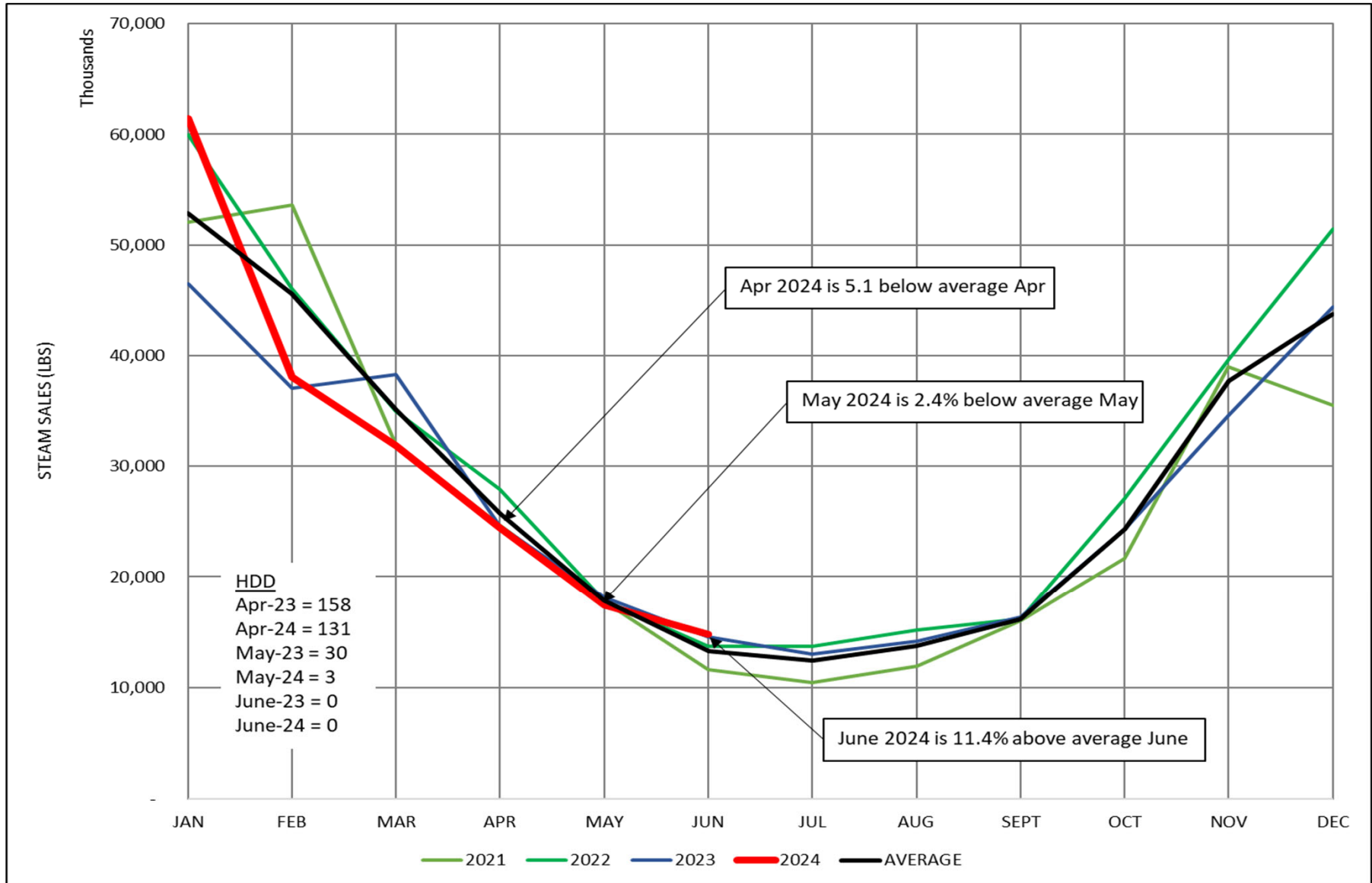
	Steam - Rolling 12 Month			Chilled Water - Rolling 12 Month		
	July 2022- June 2023	July 2023- June 2024	% Diff.	July 2022- June 2023	July 2023- June 2024	% Diff.
<b>Private</b> Cost	\$ 1,765,185	\$ 1,678,075	-4.93%	\$ 4,603,991	\$ 4,507,609	-2.09%
Usage (lbs or tonhrs)	93,801,805	95,838,260	2.17%	22,666,656	22,605,275	-0.27%
<b>State</b> Cost	\$ 2,263,886	\$ 2,071,302	-8.51%	\$ 3,534,277	\$ 3,518,462	-0.45%
Usage (lbs or tonhrs)	113,294,924	105,059,057	-7.27%	14,127,231	13,235,417	-6.31%
<b>Metro</b> Cost	\$ 2,235,828	\$ 2,050,010	-8.31%	\$ 5,098,511	\$ 5,210,904	2.20%
Usage (lbs or tonhrs)	135,171,823	133,921,586	-0.92%	25,958,323	28,685,856	10.51%
<b>Aggregate</b> Cost	\$ 6,264,898	\$ 5,799,387	-7.43%	\$13,236,778	\$13,236,975	0.00%
Usage (lbs or tonhrs)	342,268,552	334,818,903	-2.18%	62,752,210	64,526,548	2.83%
<b>Unit Cost</b>	<b>\$ 18.30</b>	<b>\$ 17.32</b>	<b>-5.4%</b>	<b>\$ 0.211</b>	<b>\$ 0.205</b>	<b>-2.75%</b>

# Figure 4A. Historic Chilled Water Sales



Averages include the years 2021, 2022, and 2023.

# Figure 4B. Historic Steam Sales



Averages include the years 2021, 2022, and 2023.

## *5. Marketing*

- Remaining Capacity for Sale (approximate)
  - 1,400 tons of chilled water
  - 35,105 pph of steam
- Potential New Customer Interest
  - ~5,000 tons
  - ~87,000 pph (or equivalent)



## *Marketing (con't)*

- Peabody St Development
  - 1<sup>st</sup> and KVB
    - Development on hold
  - 4<sup>th</sup> and Lea Ave
    - Re-evaluating development; on hold
  - Peabody and Rutledge
    - Development on hold
  - 4<sup>th</sup> and Elm
    - Developers in preliminary design; evaluating options
  - Lafayette St
    - A few developments have shown interest; all in preliminary design

## *Marketing (con't)*

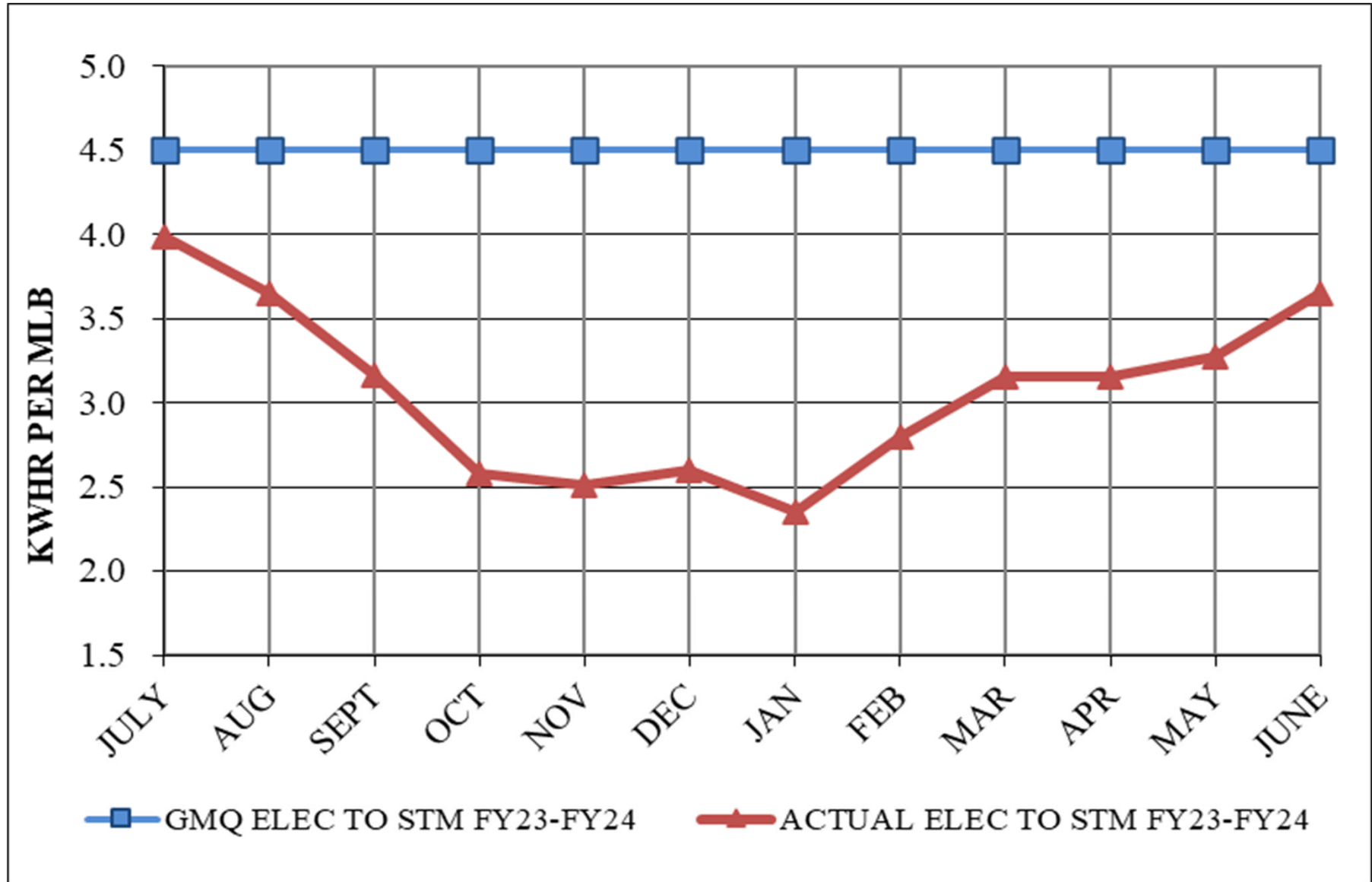
- New Developments North of KVB
  - Printer's and Banker's Alley
    - Development on hold
  - US Courthouse (Estes Kefauver Bldg)
    - Building evaluating options
  - Washington Square
    - Building evaluating options
  - 333 Union
    - Small hotel interested in chilled water
  - 805 Demonbreun
    - Large hotel interested in DES service

## *6. Review of DES Contractor Performance*

CES has made improvements in FY24 and has met several of the performance metrics for Q4. CES continues to address the system energy usage.

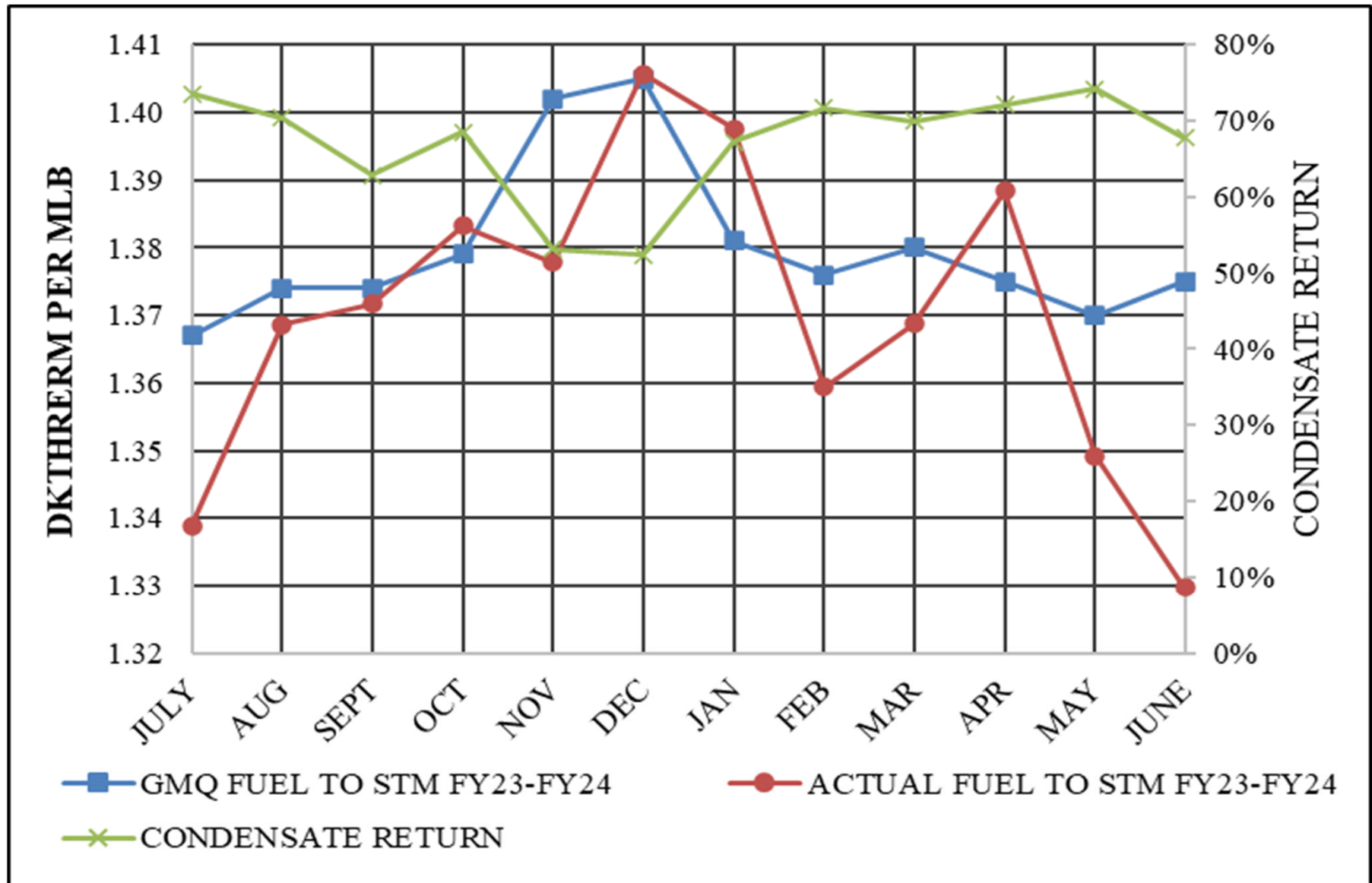
CES Operating Agreement Amendment 3 began July 1 which includes revised performance guarantees which will be in next quarter's report.

## Performance Measurement FY24: Steam Electric



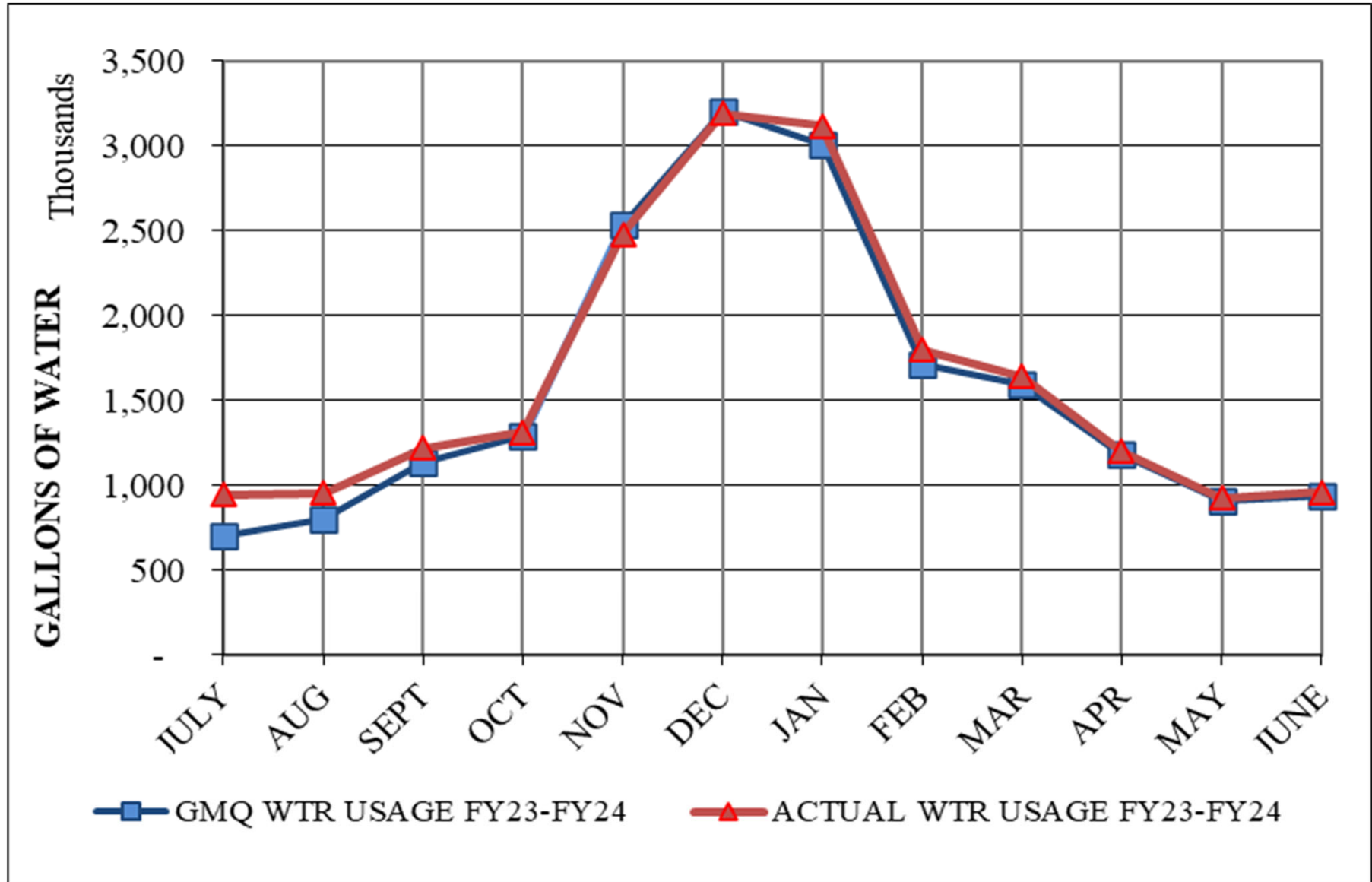
GMQ met in all months shown.

# Performance Measurement FY24: Steam Plant Eff



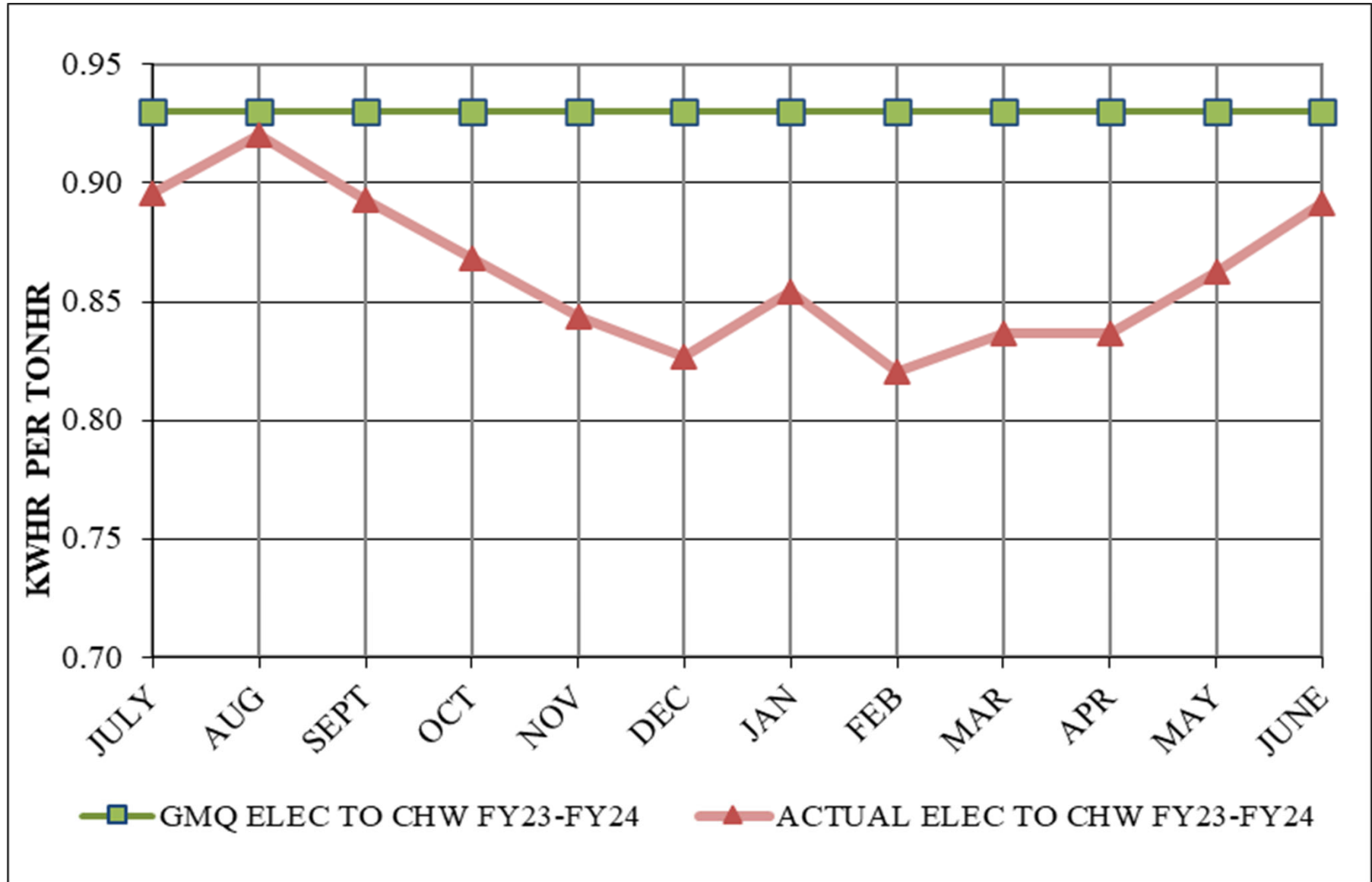
GMQ met July, Aug, Sept, Nov, Feb, Mar, May, and June.

# Performance Measurement FY24: Steam Water



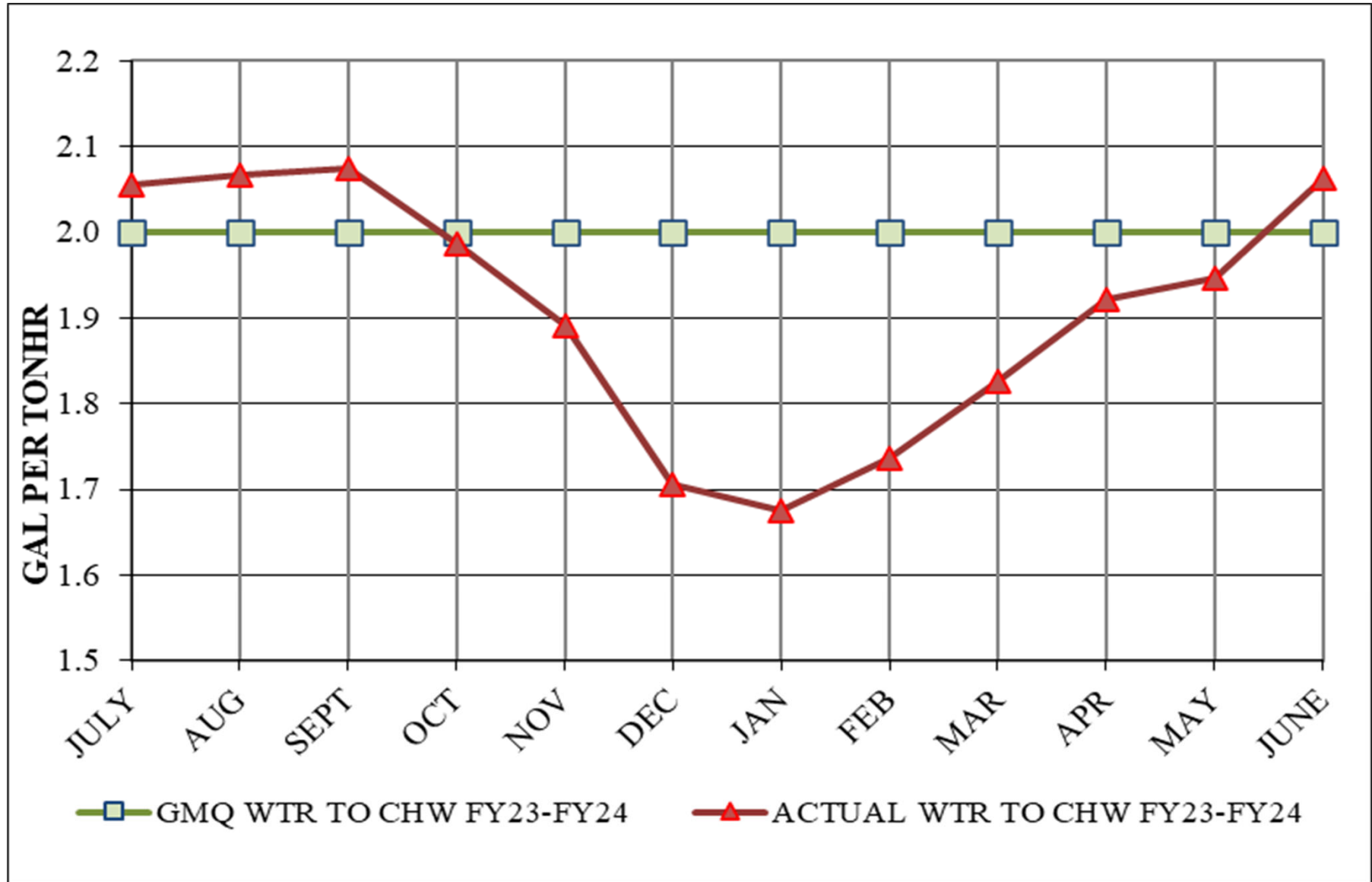
GMQ met in Nov and Dec.

## Performance Measurement FY24: CHW Electric



GMQ met in all months shown.

## Performance Measurement FY24: CHW Water



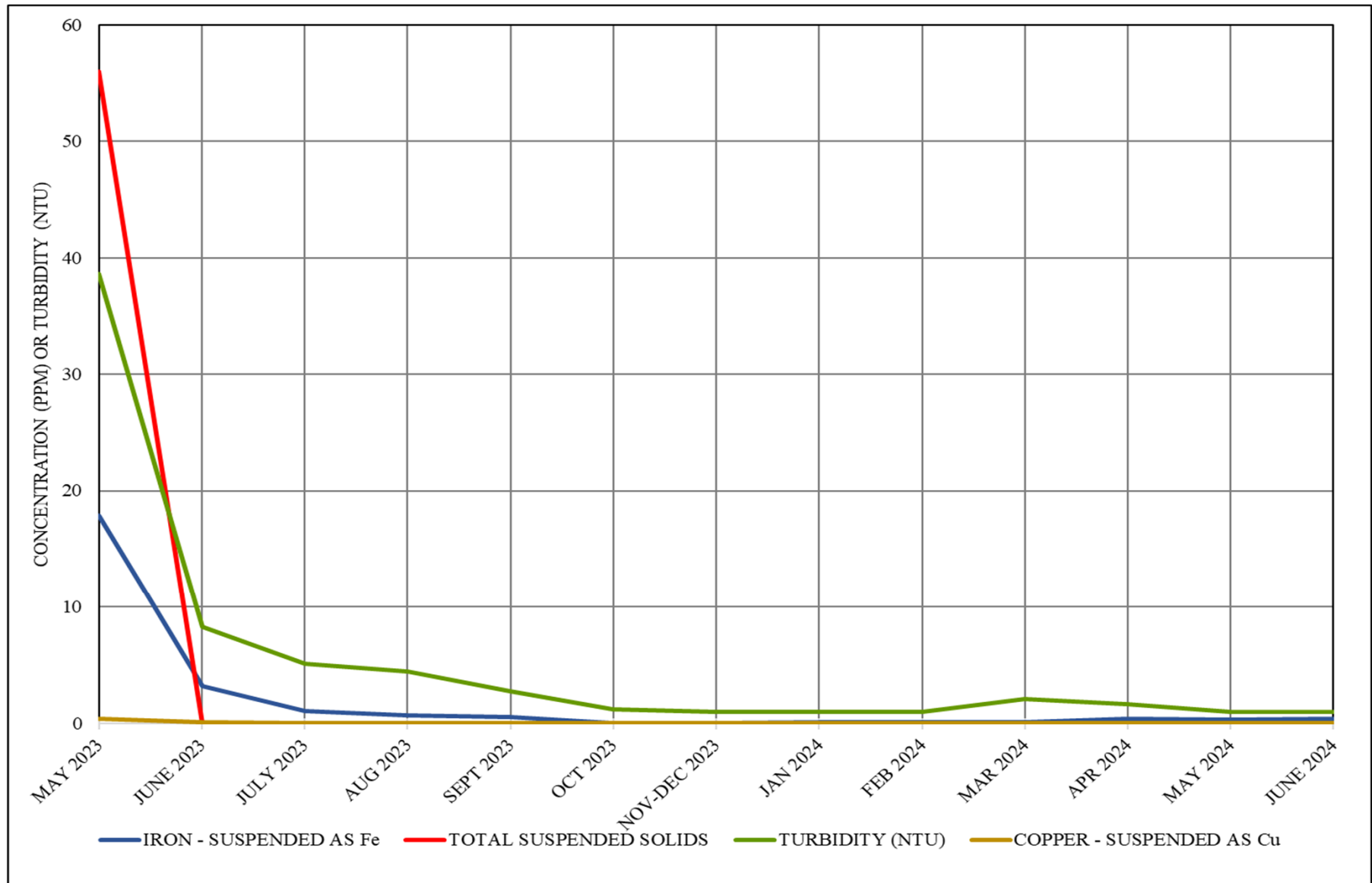
GMQ met Oct, Nov, Dec, Jan, Feb, Mar, Apr, and May.



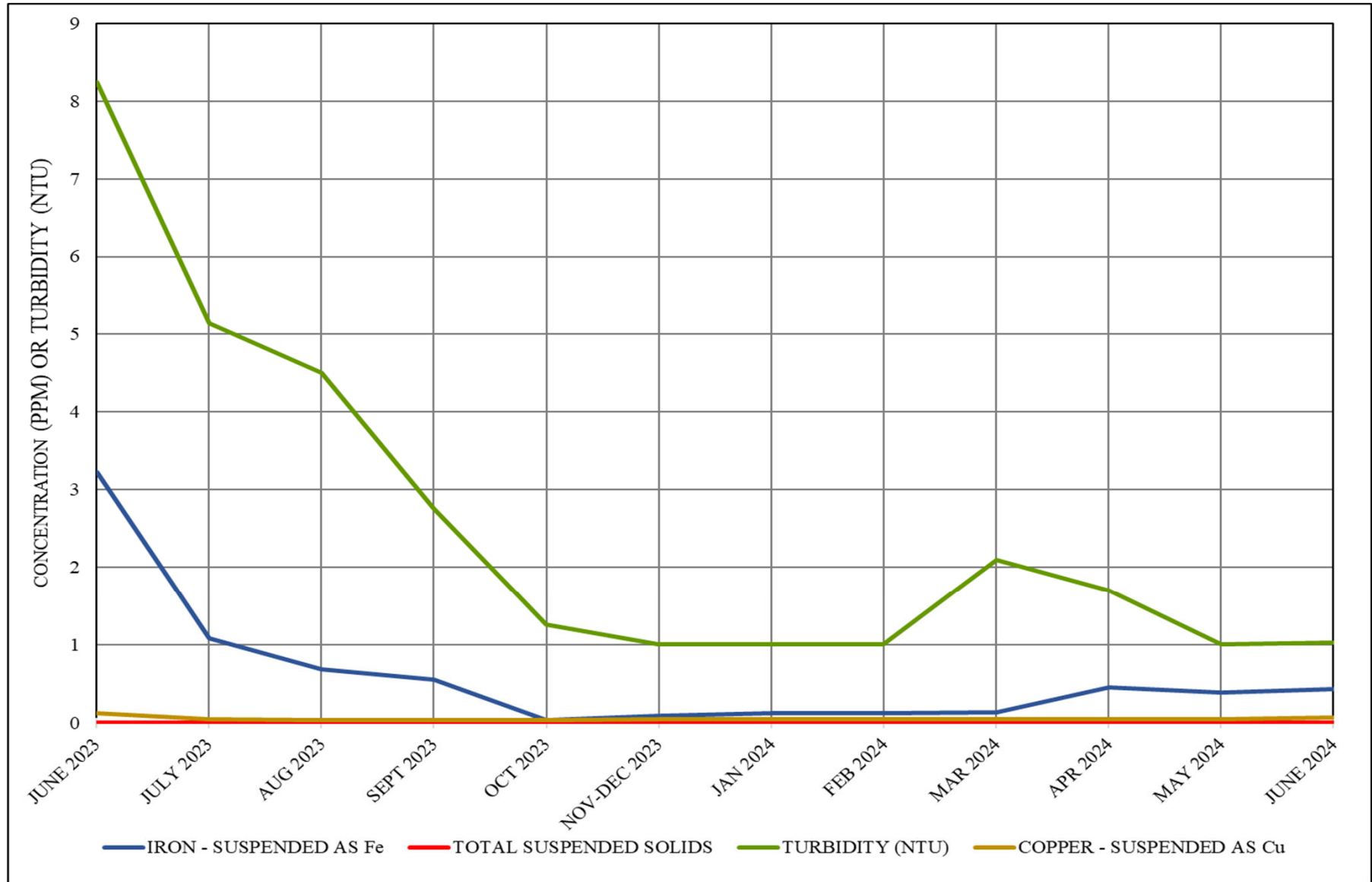
# *Water Treatment*

- ❖ Steam and Condensate
  - ❖ Corrosion
  - ❖ Iron
  - ❖ Hardness
  - ❖ Chlorine/Sulfite
- ❖ Condensing Water
  - ❖ Conductivity
  - ❖ Biologicals
- ❖ Chilled Water
  - ❖ Hardness
  - ❖ Corrosion
  - ❖ EGF and Customer Biologicals Good
  - ❖ Side Stream Filter

# Side Stream Filter Performance



# Side Stream Filter Performance



Slight increase in iron and turbidity in Mar and Apr believed to be due to increase in CHW usage.

## *7. Natural Gas Purchasing*

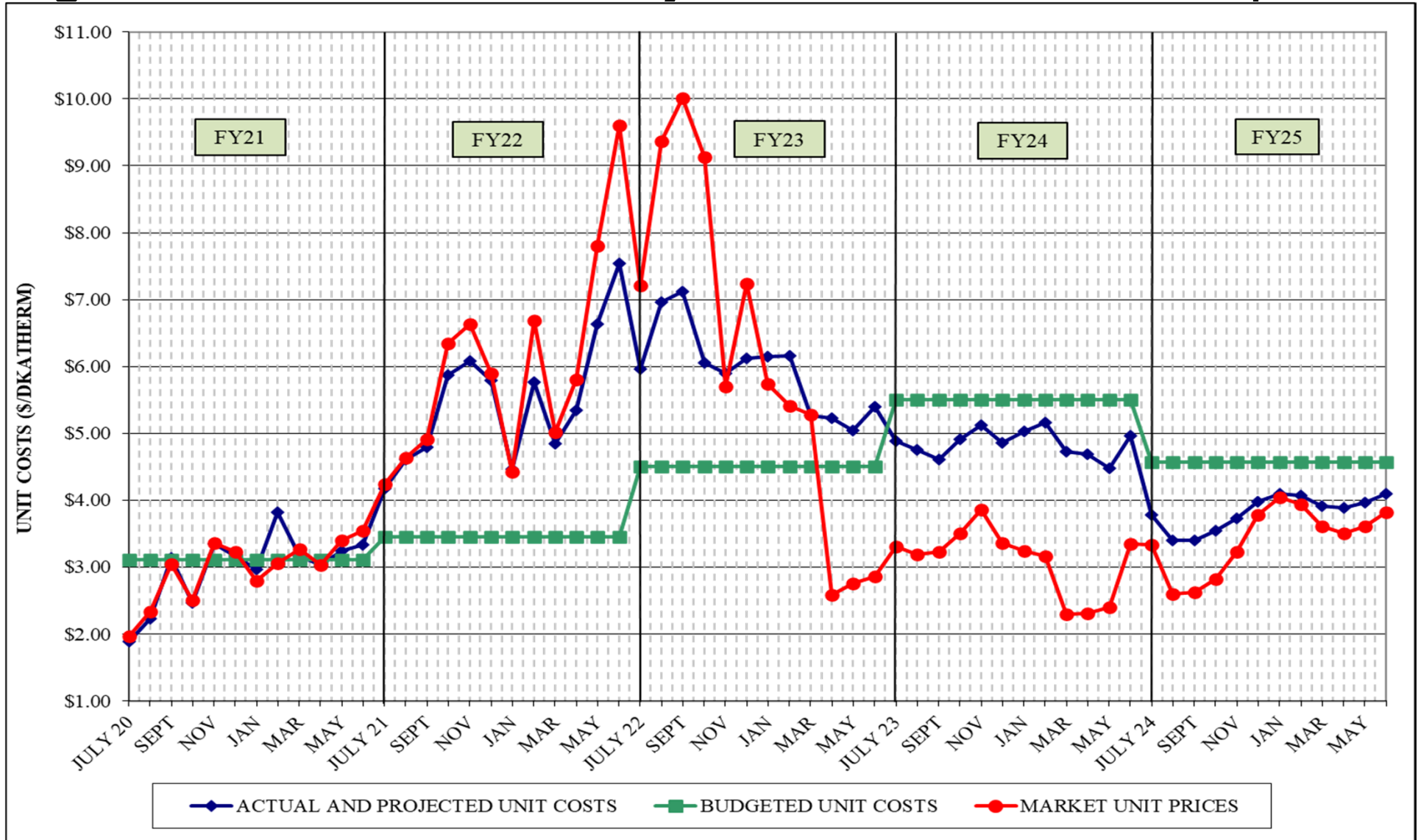
- ❖ Natural Gas Purchasing Review
  - ❖ Table 7: FY24 Gas Spending & Budget Comparison
  - ❖ Figure 7: Actual and Projected Fuel Cost Comparison

## Table 7: FY24 Gas Spending & Budget Comparison

	<b>Actual FY24 To June 30</b>	<b>Budget FY24</b>	<b>Percent Difference</b>
Steam Sendout (Mlbs)	395,730	442,449	-6.0%
Fuel Use (Dth) (includes propane)	543,563	605,370	-10.2%
Plant Eff (Dth/Mlb)	1.374	1.433	-4.1%
Total Gas Cost (includes propane)	\$2,657,775	\$4,044,800	-34.3%
Unit Cost of Fuel (\$/Dth)	\$4.890	\$6.682	-26.8%

Excludes consultant fees, FEA, and pre-purchased and stored propane; Includes transportation and actual propane costs and usages. Budget values include price and weather contingencies.

# Figure 7. Actual and Projected Fuel Cost Comparison



Currently hedging 50% of natural gas through FY25; transportation costs included.

## 8. FY24 Costs to Date

Item	FY23 Budget	FY24 Budget	FY24 Actual to date	Percent of FY24 Budget
FOC's	\$ 4,006,800	\$ 4,127,000	\$ 4,127,023	100.00%
Pass Throughs				
Administrative Costs	\$ 932,100	\$ 638,300	\$ 697,134	109.22%
Chemicals	\$ 255,700	\$ 331,200	\$ 310,886	93.87%
R&I Fund Transfers	\$ 303,700	\$ 312,900	\$ 312,900	100.00%
Water/Sewer	\$ 773,400	\$ 1,152,000	\$ 1,115,578	96.84%
Fuel Base	\$ 2,797,256	\$ 3,422,700	\$ 2,749,125	80.32%
Fuel Contingency	\$ 677,044	\$ 764,200	\$ -	0.00%
Electricity	\$ 6,394,800	\$ 6,476,700	\$ 5,417,297	83.64%
ORF Deposit	\$ 85,800	\$ 188,200	\$ 188,200	100.00%
Debt Service	\$ 4,311,300	\$ 4,774,000	\$ 4,817,650	100.91%
<b>Total Expenses</b>	<b>\$ 20,537,900</b>	<b>\$ 22,187,200</b>	<b>\$ 19,735,793</b>	<b>88.95%</b>
<b>Total Revenues</b>	<b>\$ 20,163,600</b>	<b>\$ 21,802,800</b>	<b>\$ 19,767,028</b>	<b>90.66%</b>
<b>Metro Funding</b>	<b>\$ 374,300</b>	<b>\$ 384,400</b>	<b>\$ 384,400</b>	<b>100.00%</b>

Actual Costs and Revenues to Date include FY23 True-up Items.

## 9. FY25 Budget

Item	FY24 Budget	FY25 Budget	Percent of FY24 Budget
FOC's	\$ 4,127,000	\$ 4,250,800	3.00%
Pass Throughs			
Administrative Costs	\$ 638,300	\$ 752,500	17.89%
Chemicals	\$ 331,200	\$ 379,300	14.52%
R&I Fund Transfers	\$ 312,900	\$ 322,200	2.97%
Water/Sewer	\$ 1,152,000	\$ 1,187,300	3.06%
Fuel Base	\$ 3,422,700	\$ 2,631,171	-23.13%
Fuel Contingency	\$ 764,200	\$ 795,729	4.13%
Electricity	\$ 6,476,700	\$ 6,801,900	5.02%
ORF Deposit	\$ 188,200	\$ -	-100.00%
Debt Service	\$ 4,774,000	\$ 5,385,300	12.80%
<b>Total Expenses</b>	<b>\$ 22,187,200</b>	<b>\$ 22,506,200</b>	<b>1.44%</b>
<b>Total Revenues</b>	<b>\$ 21,802,800</b>	<b>\$ 22,121,200</b>	<b>1.46%</b>
<b>Metro Funding</b>	<b>\$ 384,400</b>	<b>\$ 385,000</b>	<b>0.16%</b>

Budget shown does not include any budget true-up items.



## *10. Review of EGF and EDS*

- Routine maintenance of the EDS is the responsibility of System Operator and is defined within the ARMA. Additional maintenance is directed by the Project Administrator resulting from reviews performed quarterly for tunnels and manholes such that each section and manhole are reviewed annually as defined in the quarterly EDS reports.
- As identified in one or more EDS quarterly reports, there are several outstanding maintenance items that remain unaddressed.

## *EGF Walkthrough*

- Equipment Maintenance
  - Cooling Towers
- Operations
- Electrical
- Housekeeping
- Building Structure
- Building Exterior and Grounds

# *EDS Walkthrough*

- **Piping**
  - Manhole B steam leak
  - Valve replacements
  - Expansion joint replacement
  - 1<sup>st</sup> & Molloy hot spot investigation
- **Insulation**
  - CES work in Main tunnels
- **Water Infiltration**
  - Manhole 15/north end of 4th Ave Tunnel
  - 7<sup>th</sup> Ave Tunnel at Metro Library
  - Manhole K
  - Seepage at pipe penetrations
  - Runoff
- **Corrosion**
  - State Tunnel
  - Main Tunnels
- **Housekeeping**
- **Safety**
- **Action Items**

# 10. Capital Expenditure Update

	<b>Spent to End of FY23</b>	<b>FY24 Spending</b>	<b>Balance to Date (06/30/24)</b>
R&I Projects	\$4,644,774	\$513,651	\$77,524
49116-DES Infrastructure Fund	\$5,011,324	\$1,450,436	\$2,912,111
<b>Total</b>	<b>\$9,656,098</b>	<b>\$1,964,087</b>	<b>\$2,989,635</b>

## *Capital Projects Review*

### **Closed or Completed Projects This Quarter**

- DES 218: Manholes B2, B6, B7, B8, B9 and 22B Repairs
- DES 220: MH 20 Condensate Piping Repair and Grating Addition

## *Capital Projects Review*

### **Active Capital Projects – General & Marketing**

- DES 163: Peabody Union – working with developer on Guthrie St. impact to DES; restoration of wall nearly completed; fencing coming soon.
- DES 192: Peabody St. Developments – survey of routing down Peabody; DES plan for expansion in area with new customers.
- DES 195: DES Parking Area – on hold pending Guthrie St. mods.
- DES 201: East Bank Development – ongoing development and marketing activities related to the East Bank.
- DES 202: 7<sup>th</sup> and Commerce Hotel – building development moving forward; intends to use DES CHW and STM.
- DES 203: Printer's and Banker's Alley Building – building development on hold; intends to use DES CHW.

## *Capital Projects Review*

### **Active Capital Projects – General & Marketing**

- DES 217: DES Service to Auto Nashville Hotel, LLC (8<sup>th</sup> and Demonbreun)
  - expecting service during construction in mid-2026; 1,300 tons chilled water contract capacity with no steam
- DES 222: EDS Valve Identification and Tagging
  - project established to identify EDS manhole and tunnel valves to assist with maintenance scheduling; Project began during 4<sup>th</sup> Qtr FY24 with the completion of manhole and tunnel drawings identifying each valve; project will continue with CES adding ID tags to each valve in manholes and tunnels; project will be ongoing until all valves are tagged
- DES 224: EGF Optimization Evaluation
  - review of the EGF by Optimum Energy to identify and quantify energy savings potentials

## *Capital Projects Review*

### **Active Capital Projects – Corrosion Repair/Prevention**

- DES 211: AA Birch Tunnel and MH D Repairs
  - cleaning and coating of structural steel pipe and platform supports; work started and substantially completed during 4<sup>th</sup> Qtr FY24; punch list items to be completed 1<sup>st</sup> Qtr FY25; anticipate project closure during 1<sup>st</sup> Qtr FY25
- DES 218: Manholes B2, B6, B7, B8, B9 and 22B Repairs
  - corrosion clean-up and coating, concrete patching and sealing water infiltration; began during the 3<sup>rd</sup> Qtr; completed during 4<sup>th</sup> Qtr FY24; in close-out



## *Capital Projects Review*

### **Active Capital Projects – Repairs/Modifications**

- DES 213: 4<sup>th</sup>, 7<sup>th</sup> & Broadway Tunnel Piping Slide Support Repairs
  - repair and replacement of pipe slides; bidding anticipated in 1<sup>st</sup> Qtr FY25.
- DES 219: 7<sup>th</sup> Ave Tunnel Shotcrete Extension
  - relocation of Metro Library steam and condensate return service piping for tunnel repairs and water infiltration mitigation; bidding occurred during 4<sup>th</sup> Qtr FY24; work to begin during 1<sup>st</sup> Qtr FY25.
- DES 220: MH 20 Condensate Piping Repair and Grating Addition
  - In close-out
- DES 221: War Memorial and Legislative Plaza Renovation
  - State is renovating the two buildings requiring demo of piping and rework of DES meter stations; building offline until late 2024/early 2025.

## *Capital Projects Review*

### **Active Capital Projects – Repairs/Modifications**

- DES 223: MH 18 Electrical Repairs
  - electrical components in MH 18 need to be replaced due to corrosion; work anticipated to start during 1<sup>st</sup> Qtr FY25.

## *12. System Operator Update*

*By System Operator's General Manager*



*Constellation Energy Solutions, LLC*

## *13. Special Topics*

- ❖ CES System Operating Agreement Amendment 3 began July 1 and extends terms to end of FY28
- ❖ Customer Meeting was held June 7, 2024, with good turnout

# *14. Other Board Member Items*

# *15. Adjourn*

- *Advisory Board Meeting Schedule*
- FY25 – 1<sup>st</sup> Quarter Meeting – November 21, 2024
- FY25 – 2<sup>nd</sup> Quarter Meeting – February 20, 2025
- FY25 – 3<sup>rd</sup> Quarter Meeting – May 15, 2025
- FY25 – 4<sup>th</sup> Quarter Meeting – August 21, 2025